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ABSTRACT

This document contains the six of the seven keynote speeches from an international conference on vocational education and training (VET) for lifelong learning in the information era. "IVETA (International Vocational Education and Training Association) 2000 Conference 6-9 August 2000" (K.Y. Yeung) discusses the objectives and activities of Hong Kong's Vocational Training Council, which is Hong Kong's major provider of VET. "Reform and Development of Tertiary Vocational Education in China" (Binglin Zhong) summarizes the current situation regarding tertiary VET in China, lists its motivations and main characteristics, and outlines the policies and measures being implemented by the Chinese government in preparation for VET's continued development. "Managing Changes in the Information Technology and Telecommunications (IT&T) Industry--The Challenge for Australian Vocational Education and Training (VET) Leaders" (Heather Crawford) identifies the six most pertinent changes to the IT&T sector and considers their impact on VET providers. "Global Implications of Education's Potential for Stimulating Economic Development" (David H. Monk) describes past and future contributions of education to economic growth and development with an emphasis on VET's potential unique role. "ICT (Information and Communications Technology)-Supported Development of Competent Skilled Workers and Professionals" (Johanna Lasonen) focuses on the function of and preconditions for applying information technology in the context of education and training in Finland and elsewhere. "Whither Vocational Education?" (Lee Ngok) explains VET's place in Hong Kong's current and future education systems. Two papers contain substantial bibliographies. (MN)

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Keynote Speeches

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Vocational Education and Training for Life Long Learning in the Information Era

IVETA Conference 2000 Proceedings

Hong Kong

6 - 9 August 2000

KEYNOTE SPEECHES

The Conference will feature leading practitioners in the vocational education and training field as Keynote Speakers:

Mrs. Fanny LAW, J.P.
Secretary for Education and Manpower
The Government of the Hong Kong Special Administrative Region

Mr. K. Y. YEUNG, CBE, J.P.
Chairman
Vocational Training Council, Hong Kong

Professor Binglin ZHONG
Director General, Department of Higher Education
Ministry of Education, China

Ms. Heather CRAWFORD
National President
Australian Technical and Further Education
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Bankstown College of TAFE NSW, Australia

Professor David MONK
Dean, College of Education
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Dr. Johanna LASONEN
President
International Vocational Education and Training Association
and
Senior Researcher,
University of Jyväskylä, Institute for Educational Research, Finland

Professor LEE Ngok, J.P.
Executive Director
Vocational Training Council, Hong Kong

IVETA 2000 CONFERENCE
6-9 August 2000

Mr K Y YEUNG, CBE, J.P.
Chairman
Vocational Training Council
Hong Kong

Dr Lasonen, Mrs Law, Professor Zhong, distinguished guests and delegates.

It is with great pleasure that I address you at the opening of the IVETA Conference 2000.

Mrs Law emphasised the importance of vocational education and training in the twenty-first century. In particular, she highlighted the nature of our knowledge-based society and the crucial importance of three core generic skills, namely, communication, numeracy and information technology. I will, later, spend a little time describing how the VTC addresses these, but first I would like to provide a few facts and figures about the VTC as Hong Kong's major provider of vocational education and training.

The VTC was established in 1982 by statute and is subsidised by the Government to the tune of HK$2.2 billion a year or 85% of total annual recurrent expenditure. It has both executive and advisory functions. Its main objective is 'to provide high-quality, cost-effective vocational education and training which is directly applicable to the requirements of Hong Kong's employers and the community'.

To meet its objective the VTC establishes very close links with employers through an extensive network of representation on its Training Boards and other advisory groups, uses labour market intelligence, and provides a flexible programme of education and training courses which can respond readily to changing social and economic circumstances. To undertake its tasks the VTC runs nine vocational education institutions, 26 training, development and skills centres, an Apprenticeship Unit and a Continuing Professional Development Centre. Some 120 000 students and trainees are educated and trained annually by the VTC, served by around 4 000 staff.

The VTC offers pre-employment as well as in-service education and training courses, both full-time and part-time, ranging in level from post-secondary 3 courses to sub-degree programmes. Thus, the part the VTC plays in the community is considerable. This is reflected in its role, size, the significant commitment of public funds by the Government, and the length, breadth and variety of courses it provides.

The VTC always strives to respond to all relevant Government and community requirements, and socio-economic changes. This is best illustrated by describing some of the major factors influencing the change in the provision of vocational education and training over the past three years and how the VTC has been responding to them.

First, during that period of time, a factor which has influenced Hong Kong considerably was the financial crisis which hit the region. After a decade of impressive economic growth and full employment, Hong Kong, in common with its neighbours, experienced an unprecedented economic setback and unemployment. This coupled with setbacks in public spending, has affected the VTC in two ways. We have to become much more cost-effective without significantly affecting the quality of our services, and we have had to identify more closely the education and training needs of the unemployed, particularly school-leavers, to enable them to compete for jobs in a more competitive and demanding labour market.

Secondly, in common with other developed societies, over the past decade or so Hong Kong has experienced a shift out of direct manufacturing into manufacturing support and into such service industries as banking, insurance, tourism and other trade and finance related activities. A common requirement of these service industries is the possession of increasing high language and IT skills.

We coped with cutbacks in public spending by regrouping the provision of vocational education under a single Institute of Vocational Education and doing away with training courses which are no longer relevant. We achieved considerable savings, some of which has been redirected towards new training programmes required by employers. In this process of re-prioritisation we have also taken the opportunity to strike a better deal with the Government by way of a new Memorandum of Administrative Arrangements. The most significant aspect of the MAA relates to financial arrangements. In common with many Government subvented organisations throughout the world, the VTC has been funded on a deficiency grant basis, that is, an annual sum is granted representing the differences between approved spending and approved estimates of fee income, and any unspent funds must be returned to Government. This arrangement does not encourage cost saving and stifles initiative, as funding is not available for quick investment in new services.

Our MAA with the Government now allows the VTC to be funded through a discretionary grant whereby, annually, the VTC can keep up to 15% of any real savings it achieves, and to use the funds for new activities, for example, experimental training courses. Such an arrangement encourages cost-effectiveness and initiative. The MAA also goes into detail about triennial and annual planning and budgeting, as well as measures by which we measure our performance.

We believe that the MAA and, in particular, the introduction of the discretionary grants is a considerable boost to the VTC's operation and very much in the interest of progress in vocational education and training. As such, we recommend that those organisations present at the conference who may be funded on the deficiency grant basis might encourage their funding masters to consider the discretionary grant approach.

In recognition of the shift from manufacturing to the services industries, the VTC has nearly halved the number of places on its engineering and manufacturing craft courses and reduced its apprenticeship provision, replacing them with more generic service-

biased Certificates in Vocational Studies, plus new trainee places on programmes for the hospitality group of industries and for mechanical and electrical services.

Thirdly, with regard to the acceleration of IT in the economy, the VTC has enhanced the relevant training centre to became an IT Training and Development Centre (ITTDC). The Centre is providing hundreds of places on IT Assistant Training Courses for secondary 3, and 5 school-leavers and mature unemployed persons. These courses, resulting from a Government initiative, are of 10 weeks duration. ITTDC also offers Professional IT Training Courses to graduates either on a two-month, full-time basis, or seven months part-time and new IT in-service IT Upgrade Courses. 110 of the latter currently are running.

In parallel, the VTC's Institute of Vocational Education (IVE) has over the past two years redesigned all its sub-degree courses, 72 of which are IT related and 45 have rich IT content. The VTC is greatly encouraged and supported by the Government in IT developments. For example, the Government has decided to invest HK $176 million in upgrading the VTC's IT infrastructure.

Finally, I would like to describe one other initiative we launched in recent years. This covers the important core generic skills requirements highlighted by the Secretary for Education and Manpower, namely, communication, numeracy and IT. The initiative is for new courses which not only address the three core skills, but also serve to provide motivation and an improvement in the ability of the participants to compete in the job market.

The initiative arose as a result of the awareness by the Government and the VTC some two years ago that the pool of unemployed secondary 5 school-leavers with mediocre educational achievements not only did not have a sufficient educational attainment to enter further education, but also did not have an education directly applicable to the world of work.

The new courses, offered as a one-year, full-time Foundation Diploma and a two-year, part-time Foundation Certificate, aim at bringing the students up to a five HKCEE pass equivalent, by way of a curriculum that focuses on remedial teaching in English, mathematics and the use of computers. This allows them to compete for further education, but also equips them with basic generic skills making them better fitted for the world of work. The VTC commenced the Foundation Diploma with 2 000 places and 760 Foundation Certificate places in September 1999. The Government recently announced funding for a further 1 000 full-time places for September this year.

We believe we have done a reasonably good job over the past three years. There remains, however, a good number of future challenges and there is no room for complacency. But we do know that we are moving forward in the right direction.

It remains for me to join the Secretary of Education and Manpower in wishing all of you here today a rewarding and stimulating conference.

Thank you.

REFORM AND DEVELOPMENT OF TERTIARY VOCATIONAL EDUCATION IN CHINA

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Abstract: This essay introduces the general situation of Tertiary Vocational Education in China, and demonstrates its motivations and main characteristics and experiences of training. Moreover, it gives some information about relevant policies and measures implemented by Chinese Government and the developing blueprint for the next period.

1. CURRENT SITUATION OF TERTIARY VOCATIONAL EDUCATION IN CHINA

Since 1980s, in order to adapt to the needs of modernization construction with Chinese characteristics, a lot of colleges, namely advanced specialized institutions, short-cycle vocational colleges and adult higher educational institutions, actively participate in the reform of educational provision. They have adjusted their training objective, attached more importance to cultivating the practice-oriented talents oriented to the frontline of manufacture, construction, administration and service etc. Up to now, they have made considerable progress and got some good experience. Since 1990s, China has paid more attention to the development of tertiary vocational education, clarified its training target, meanwhile, a number of new tertiary vocational colleges have been founded. Although, these types of colleges as mentioned before have different name and own characteristics, their main objective is to produce skilled professionals. According to statistics of 1999, the scale of tertiary vocational education in China is as follows:

- There are 1345 independently-running tertiary vocational colleges across China, taking up 69.26% of the total of higher educational institutions, among which 313 are advanced specialized institutions, 161 short-cycle vocational colleges and 871 higher educational institutions for adults. Besides, there are 982 Adult Educational Colleges attached to the regular universities and 37 colleges run by social forces.
- The total enrollment is 3,980,600, accounting for 55.37% of the whole higher educational institutions, among whom 1,127,300 are in advanced specialized institutions, 234,200 in short-cycle vocational colleges and 2,619,100 in higher educational institutions for adults.
- College graduates number 1,189,000, covering 68.50% of the total graduates from higher educational institutions among whom, graduates from advanced specialized institutions reach 365,300, short-cycle vocational colleges 41,400 and adult higher educational institutions 782,300.
- The number of new entrants in college adds up to 1,476,900, making up 53.62% of the total recruit of undergraduates in regular universities and colleges, in which advanced specialized institutions and short-cycle vocational colleges newly admitted 478,400 students, higher educational institutions for adults 998,500.

2. FOUR MOTIVATIONS TO DEVELOP TERTIARY VOCATIONAL EDUCATION IN CHINA

1. With the rapid increase of social demands for various advanced skilled talents, measures must be taken to adjust educational category and structure. It is in such a situation that tertiary vocational education came into being.

Social talents seem to be grouped as follows: academic talents; engineering talents; technical talents and skilled talents. Academic talents conduct research on natural and social laws, engineering talents engage in design, decision-making and work planning. Only the advanced skilled professionals, namely the technical talents and skilled talents, are those who appear on production or working frontlines and convert engineering designs, decisions and layouts into material things (such as products or projects etc.), bringing direct benefits to the society.

It has been proved that laborers' low quality and lack of scientific creativity, as a major factor, has restricted China's economic growth and international competitiveness. Not only do we need to cultivate a great number of talents who can conduct scientific research or project design but also we need numerous advanced skilled talents working on production forefront or being engaged in construction, manufacturing works etc. It is for this reason that tertiary vocational education has mushroomed and will play an important part in rational adjustment of higher education structure.

2. With the rapid development of economy and great advance in science and technology, the role of advanced skilled professionals becomes increasingly important. Therefore, tertiary vocational education is urgently needed.

After the Second World War, especially since the 1960s, great advance in science & technology and the rapid economic growth have brought about overall changes in employment posts. The wide application of advanced technology resulted in the appearance of many new professional posts, such as robot technician, data processing and system analyst etc. The flourishing of the third industry featured by service brought about another series of new job posts, for instance, advertisement editors, advertisement promoting supervisor, enterprise assessor, security consultants, investment analysts and so on. The previous posts have been either differentiated or compounded. Take the nurse post for example, with the development of medical and nursing technology, nursing become more and more specialized. There have been spiritual nurse and surgical nurse etc.

Whether the new job posts resulted from technology development or from the third industry, they both require advanced technology and high intelligence, which goes far beyond the training target of Secondary Vocational Education. Differentiation of professional posts in technological level demonstrates two factors: on one hand, more kinds of technology are requested on one post; on the other hand, technological level is increasing. Thus it can be seen that with the changes in social technical posts, technical education must be upgraded to higher level, then professional education, which is tertiary vocational education in China, should aim to train advanced skilled professionals.

3. To develop tertiary vocational education is an important way to improve the whole nation's scientific and cultural quality.

China is a large and populous country. It's hard to make more young people receive higher education by merely depending on regular universities. Meanwhile, with the improvement of living standards, people are more eager for higher education nowadays. So only through vigorously

developing tertiary vocational education can make it possible for more people to receive higher education. This is an important access to improve the whole nation's scientific and cultural quality.

4. According to the trend of world educational reform, tertiary vocational education should be developed.

Since the 1960s, various kind of tertiary vocational colleges have mushroomed throughout the world. There are community colleges in North America, polytechnics attached to universities and multi-subject technical colleges in the U.S., Fachschule and Dual-System vocational colleges in Germany, polytechnics in Australia, short-term technical colleges in France; short-term universities and technological scientific institutes in Japan, junior vocational universities in South Korea and so on. These colleges all cultivate advanced skilled talents, with two-or-three schooling years. With the worldwide tertiary vocational education flourishing, China will drawing on good foreign experience and methods, at the same time, actively explore the best way to produce advanced skilled professionals in accordance with the reality of China.

3. FUNDAMENTAL CHARACTERISTICS OF TRAINING PROGRAM OF TERTIARY VOCATIONAL EDUCATION IN CHINA

The six fundamental characteristics of training program in tertiary vocational education are as follows:

- The essential task is to cultivate advanced skilled talents who are specialized in advanced technology application and are competent for production, construction, management and service forefront.
- The objective is to meet the requirements of society. Take technology application ability as the training target, design the frame of students' knowledge, ability, quality structure and training program. Graduates should possess such qualities as wide range of knowledge, appropriate basic theory and strong technology application ability.
- The system of curriculum and teaching content should be constructed with application ability as the key factor.
- Practical Teaching and skill training, as a main method to train students' technology application ability, should take up a comparatively large part in teaching content.
- Development of faculty with Two Qualifications (one is for academic, such as professor, assistant professor etc; the other is for practical work, for example, qualification of engineer or accountant etc.) is essential to the improvement of teaching quality.
- The fundamental way to train advanced skilled talents is to carry out co-operations between colleges and the industrial world, between teachers/students and practical laborers, moreover, to combine theory with practice.

4. POLICIES AND MEASURES FOR DEVELOPING TERTIARY VOCATIONAL EDUCATION IN CHINA

- **Administrative system**

According to the *Law of Higher Education of the People's Republic of China* and the relevant documents of State Council, tertiary vocational education are mainly administrated by provincial level governments. Under the guidance of the state's macro-policy, governments at provincial level

take their own condition into consideration, which consists the local economy demands, enrollment capacity and graduating students' employment. Then they determine annual enrolment plan, enrollment methods, curriculum programming, charging criterion as well as registered residence management. They are responsible for distributing certificates of academic diplomas, giving advice on employment to graduating students and determining the averaged allowance criterion for each student. Meanwhile, they bear the responsibilities for educational quality, working out regulations for educational provision and improving school facilities etc.

The Ministry of Education of the state is mainly in charge of overall planning, macro-control, synthetically coordinating relations among various branches, formulating basic and unified quality criterion and administrative methods, working out annual directing plans and exercise supervisions and inspects.

- **Tertiary vocational education provision**

Tertiary vocational education has multi-forms provisions. At present, institutions in which tertiary vocational education is conducted are: short-term vocational universities, vocational and technical colleges, advanced specialized institutions, independent higher educational institutions for adults, tertiary vocational education units attached to some regular universities (subordinate college) and private colleges or universities run by social factors etc. The main forms of running a school are full-time, part-time, teaching through correspondence, broadcasting or television etc.

- **Program setting**

Programs of tertiary vocational education are set up and adjusted according to the needs of local economy and social development, and all the specialties are determined by colleges themselves and then reported to the local educational administrative departments for the record. The scope of specialties can be wide or narrow. At present, the Ministry of Education is starting to draw up *A Guide to Setting up Specialties of Tertiary vocational, which* offers tertiary vocational colleges a reference.

- **Period of schooling**

The general schooling of tertiary vocational education ranges from 2 years to 3 years in length. Generally speaking, the specialties concerning management require 2 years and the specialties of technology 3 years. The period of schooling of part-time students is appropriately prolonged. Students graduating from junior middle school require 5 years to complete their study.

5. THE BLUEPRINT FOR REFORM AND DEVELOPMENT OF CHINA'S TERTIARY VOCATIONAL EDUCATION

1. Improving the patterns, contents and methods of training talents.

Formulating and implementing *The Plan of Construction and Reform on Patterns of Training Talents and Teaching Contents of Tertiary Vocational Education oriented to 21st Century*. Trying to find, within 5 years, some exemplary and influential patterns of training with virtual breakthroughs in tertiary vocational education. And trying to bring out a number of optimized teaching programs and produce a number of printed or audio-visual teaching materials and relative software which are all creative in both content and form.

2. Speeding up compiling of textbooks for tertiary vocational education.

Compiling 500 kinds of textbooks with outstanding tertiary vocational characteristics in 5 years or so, and we will take two steps to finish the task. The first step is to encourage compiling this kind of textbooks on the basis of previous ones, which will last for 2 or 3 years. The second step is to produce a large number of excellent textbooks with tertiary vocational characteristics of our country then form a complete set of optimized textbook system in another 2 or 3 years.

3. Speeding up training teachers with double qualifications.

We'll choose a number of tertiary vocational colleges with good conditions, excellent teaching quality and distinctive tertiary vocational characteristics, setting up 30 teachers training bases of tertiary vocational education. And within 5 years, all the middle-aged and young teachers will take their turns to receive training of vocational education theory and technical skills so that we can qualify them for new teaching tasks. Based on certain academic level and teaching level, directing them to get double qualifications. The objective is to make 80 percent of professional teachers to obtain two qualifications. Meanwhile, China will take an active action to co-operate with foreign technical colleges in the field of teachers' training.

4. Speeding up construction of practical training bases

In order to meet the needs of the new teaching system, it is necessary to set up 100 high-level local practical training bases of tertiary vocational education with good experimental and practical conditions, which enable students to receive more effective training on practical skills. The above-mentioned bases should play an exemplary role and be open to other tertiary vocational colleges in the said area.

5. Perfecting the evaluating system of tertiary vocational education.

China will set up teaching evaluation system in accordance with tertiary vocational education laws and characteristics. The Ministry of Education has established *working committee on human resource development through tertiary vocational education* and will set up as soon as possible the Steering Committees of Basic Courses and the Steering Committees of Specialties Teaching. The later is mainly composed of experts in the fields of economy and enterprises and professors in colleges.

6. Accelerating the reform and construction of professional programs in tertiary vocational education.

Creating 300 professional programs as models. By comprehensive improvement in professional programming, training target, curriculum, educational methodology, faculty development and practicing bases, China try to enable the specialties to actively meet the needs of social economy and development, focusing on advanced skilled talents training. Within 5 years or so, setting up 30 model tertiary vocational colleges.

7. Attaching great importance to the researches on teaching theories of tertiary vocational education.

The results will be used to direct teaching reform, and gradually to form a complete set of theories on tertiary vocational education suits to China.

MANAGING CHANGES IN THE INFORMATION TECHNOLOGY AND TELECOMMUNICATIONS (IT&T) INDUSTRY – THE CHANLLENGE FOR AUSTRALIAN VOCATIONAL EDUCATION AND TRAINING (VET) LEADERS

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Abstract: Within the Australian context of industry and educational reform Heather will identify the 6 most pertinent changes to the Information Technology and Telecommunications sector and indicate how these changes will impact on vocational education and training providers.

She will address how leaders of education reform can harness the opportunities presented and prepare themselves to lead staff and students to a more responsive environment, that will meet the demands placed upon it.

In her presentation at the conference she will highlight some examples of Australian Best Practice against a change model that is relevant to the IT&T sector.

> **In a digital and knowledge economy, competitiveness rests on the skills of people**
>
> ***IT&T Industry Task Force***

The Australian VET context has changed significantly over the last 10 to 15 years to foster local and international competitiveness, provide more flexible learning options for students, to develop a national framework which ensures portability of qualifications and recognises the existing knowledge and skills held by the Australian workforce.

The change experienced by Australian educators is indeed a familiar trend world wide. This combined with substantial industry restructure and reforms in workplace practices has ensured that no educational disciplines have remained unchanged.

Of all the educational/industry reforms the IT&T sector has argumentatively been one of the most affected.

Their change includes:

1. The emerging knowledge economy and the rapid spread of, and need for technology not only in educational sectors, but new consumers, business and industry. In today's "knowledge economy" suppliers and consumers continuously exchange information about the development and delivery of products and services. Increasingly, this frenzy of information exchange takes place between people at vast/global distances from each other. Where once educational institutions held all the knowledge it is our reality that increase of personal and business/industry web pages has meant many other providers can sell new knowledge through education and training, and more Australians are turning every day to e-commerce solutions for skills development.

The www is just one step in a progression of steps. According to [1]Peter Moore we have only progressed about 10% down the ultimate path. There is a lot of potential out there, the market is by no way saturated. We are really right at the very start of business opportunities associated with a monumental roll out – the "herd" effect is about to take off.

Currently only 25% of homes are connected to the www, less than 10% of businesses order on the internet, and only 20% of companies are involved in internet sales. Very few areas of business in the economy are using e-commerce, it is only really some areas of retail, groceries, banking and education. The National Office of the Information Economics (NOIE) has major initiatives in health and education.

If we are only 10% now and our business is already affected, where will we be in 5 years' time when half the globe is internet enabled?

2. Increase in job opportunities

There is both a worldwide shortage of skilled IT professionals and a rapid increase in demand for jobs. According to the [2]IT&T Industry Skills Task Force it is estimated that there are currently around 360,000 people primarily engaged in IT&T activity in Australia. IT&T employees account for 4.2% of the total Australian workforce. It is hard to estimate what the employment figures are in the IT related jobs, or jobs where IT is a critical requirement. The future growth in demand for IT&T skilled people over the next five years is expected to be:

In 1 Year	In 3 Years	In 5 Years
+ 29,700	+ 87,700	+ 169,500

Of all IT&T employees, the current top three IT&T activities in which employees are mostly engaged are:

- Communications technicians – (25%);
- Applications development and programming - (14%); and
- Call centres – (8%).

The Top three IT&T activities in which organisations are mostly engaged are:

- Applications development and programming - (72%);
- Network management/support/integration - (59%); and
- Applications implementation - (54%).

The three fastest growing areas of activity over the next five years will be:

- Internet services and support – 174% growth;
- Multi-media content development – 164% growth; and
- Services consulting – 126% growth

The areas of current work in strongest current demand are:

Client/server applications, Internet and multi-media, Database management systems, System software and support, Process/systems management/consulting, Office/E-mail/Groupware, Networking, LAN administration

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[1] Peter Moore
E-commerce and the New Economy, Australia National Office of the Information Economics (NOIE) 2000.
[2] http://www.aiia.com.au/education/skillstaskforce.execsummar.html

Positions where the most intense demand pressures are expected over the next five years are:

	Percentage who expect positions will be very difficult to fill
Systems architects	64%
IT Strategists	54%
Database Administrators	39%
Services Consultants	37%
Business Analysts	35%

[3]Dr. Kemp, our Federal Minister for Education, indicated that the IT industry is making a major contribution to Australia's productivity. It is one of the major contributors to low inflation and that there is a strong potential for IT training in Australia to meet the present job requirements. He went on to say that Technology turnaround is now 3-6 months, and the education sector must produce skills in shorter timeframes than at present. To do so we need to remain ahead , we need to have a more flexible education sector to meet the demands of the IT industry sector. He challenged VET providers that there is a need in the education sector for reform to respond not only to IT but all other enterprises.

3. The pace of change often comes down to the survival of the fastest. Those into the market first, whether in education, e-commerce, or e-learning, etc., have most to gain.

[4]Geoff Scott in his paper ***Change and Educational Leadership*** agreed that if colleges and universities don't respond appropriately, their very existence, at least, in its present form is under threat.

We may ask, "Who's to blame for the shortage of trained staff – government, industry or the education sector?"

Well, no one is to blame. The technology has just moved so quickly that it has taken everybody by surprise. For example, colour TV took 35 years to achieve the same level of uptake that the Internet achieved in just 4 years – the length of time of a typical undergraduate course. IT&T products are now often redundant after just 12 months.

Industry will have to become more strategic in its approach to training and Human Resources generally, education and training providers will have to find better ways of monitoring and serving industry demand and government will have to help provide a flexible and responsive business environment and education and training policy framework.

4. The need to colonise and mobilise growth in this area will only be achieved through strategic partnerships, alliances, relationships and attachments with all educational sectors, industries and businesses.

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[3] Dr. Kemp, Federal Minister for Education, Australia.
Opening address at Networking 1999 Seminar on 3 September.
[4] Geoff Scott, University of Technology, Sydney.
Change and Educational Leadership 2000

Peter Moore indicated that individual organisations, no matter how large, cannot survive by themselves in the New Environment as evidenced by Telstra and News Corp.

5. The need to be risk-takers and managers of risk

There is a need for careful, quick and creative decision making centred on student and industry needs.

[5]Barry Hobart, Chief Consultant to UNESCO UNEVOC Centre in Berlin, noted that VET teachers and trainers have the most crucial role and responsibility to assist in this development. They must undertake programs of initial and recurring professional development and need to be involved in continual upskilling and updating on changes and new requirements of the workplace so that they can continue to adapt to the rapid change, be relevant and be ready to embrace change.

6. Pressure from competitors for a percentage of VET training markets. IT now increases that pressure as universities and VET providers from interstate and overseas promote and market to what was traditionally our markets. This gets impacted to a greater degree in country and remote areas of Australia where they are vulnerable. The pressure on the VET sector only mirrors the increased pressure placed on the industry because of the global growth of the industry as a whole. All industries are using IT to leverage competitive advantage.

OUR ROLE AS EDUCATION LEADERS

> **"When the winds of change blow; some build walls, others windmills"**
>
> ***Dr. Qian tang***

If we as managers and educational leaders don't embrace the opportunities that these changes bring to rejuvenate our colleges, teaching and learning strategies, then we will eventually truly be outdated, irrelevant and the industry/business we serve will be disillusioned about the value of accredited national training. To be eventually judged as a bureaucratic, bungling, irrelevant provider of education and training will lead to our, and my, eventual demise.

So what do I need to do to suitably meet the challenges and ensure a bright future? I list some of the most important factors, in reality there are more. They are:

1. Look for and promote cross sectoral, cross industry partnerships.

[6]Thorn indicated that the best practice principles for conducting partnerships with industry were:

- Understanding the business and the relationship between training and profitability of the enterprise;
- Being available;
- Sharing knowledge and expertise;

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[5] Barry Hobart, Chief Consultant to UNESCO UNEVOC Centre, Berlin
Training Review October/November/December 1999 – "Going Global" Pages 12-13
[6] Mr F. Thorn, *ANTA National Conference "**Spotlight on the Provider**".*

- Managing the relationship;
- Collaborating with competitors with a view to the best outcome for the client.

There is an increasing focus on learning and consequentially teaching. This learning may occur on job and off job and may be government funded, employer funded or self funded

2. Learn to walk the talk

The new technology and its application in VET calls for innovative and creative talk, where ideas can be exchanged and are expected.

Professional associations such as IVETA and AUSTAFE have an important role to play.

You need to get involved in such things as:

- innovative systems;
- R&D;
- emerging industries; and
- new technology development.

It is important to talk to people who are walking the talk.

3. Plan for Web-based interactive education offering and plan for the technology to support

Often barriers are expressed as the existing technology infrastructure, time to develop programs etc. College and Institute-based planning can assist.

4. Take time to look at the future

[7]Daniel Burns in his book ***Future View*** suggests that we can be too bogged down with day-to-day work and not become a futurist by knowing the tools that exist and creating applications that suit. He suggests we ask ourselves some hard questions eg.

Are we learning as fast as our students? No? Then get a technology mentor.

Is change happening from outside (crisis management) or inside (controlled plan management)? Outside? Then take time to plan.

In order to speed up are you prepared to slow down? Think strategic!

Are we looking backwards, concentrating on the now, or are we travelling forward? Perform a time travel audit. It's all in the mind.

5. Manage change well by:

5a. <u>Concentrate more explicitly on the how of change not just the what</u>

Introduce staff involved in core developments in TAFE (like a move to flexible or online learning) to change frameworks early on. This helps staff with change because they will be clearer on how it works, why some steps are important and where these fit into the bigger picture of effective change management. As a result they will feel less anxious because they will not feel they are mixed up in processes and forces which they don't understand. Labelling what is likely to happen before it actually does reduces anxiety and feelings of personal inadequacy.

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[7] Daniel Burns, Author. "***Future View***"

5b. Look to alternative models for achieving success

Look outside the box. Developing and rearranging specialisation with our competitors is a good place to start.

5c. Support, reward and recognise staff initiative

Remember that the best initiatives don't always come from those at the top. Remember to celebrate best practice.

Some web pages of interest are:

- LIVENET

  http://livenet-demo.it.uts.edu.au:8080

- Australian Technology Park (ATP)

  www.tafensw.edu.au/ipc

- Lidcombe College of TAFE

  http://www.ssi.tafensw.edu.au/colleges/lidcombe/lidcomb.htm

- Curriculum Corporation

  http://www.curriculum.edu.au/vetis

6. Always question in whose interest are the changes being made

This is our moral and best practice managers' obligations. For example, is it in the best interest of students, business promoters, the economy?

IN CONCLUSION

> **IT&T industries need to farm instead of fish for its staff.**
>
> ***Karen Whittingham***

There is no doubt that educational managers have to respond to the changes as previously mentioned.

In this paper I have tried to outline what I feel are the challenges and the opportunities within this context of change. I hope that my paper acts as a kind of wake up call for all to get up and get going with implementing/undertaking what you need to do.

This may mean for:-

Education and Training Providers where there is a current trend to maintain what is currently in place but apply new technologies to delivery - that they have to challenge this thinking. Do they need to focus on new gradual change, or radical improvement?

There is already a need to move to a new paradigm for a new type of customer, which involves new delivery of skills and knowledge to these new clients.

Vocational Leaders that as we, managers and educational leaders, standing at the edge of a new millennium with the potential to revitalise learning that we have responded appropriately in well thought out and coordinated ways.

Industries that where they intend to recruit for skills alone, they will have to think about strategic alliances with educational institutions and investing in training.

Professional Associations such as AUSTAFE and IVETA, we need to encourage the critical debate, research and healthy discussions that occasions like this conference, afford.

Together we can indeed build a healthy future that is more than capable of meeting future IT&T needs.

GLOBAL IMPLICATIONS OF EDUCATION'S POTENTIAL FOR STIMULATING ECONOMIC DEVELOPMENT

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Index: Education and economic development, human capital, education and earnings, economic returns to vocational education

Abstract: An examination of past and future contributions of education to economic growth and development with an emphasis on the unique role that can be played by vocational education.

1. INTRODUCTION

Education has proven itself to be a powerful engine for economic growth and development. At the same time, lessons have been learned and there is a growing realization that simple expansions of the education sector are not sufficient to guarantee desirable economic and social outcomes. In this paper, I have two purposes. First, I provide an overview of how economists think about relationships between education and economic growth along with a sketch of the basic empirical findings. Second, I develop the thesis that as powerful as education has been as a source of economic growth during the post World War II period, it has the potential to be even more powerful in the future. I will argue that the realization of this potential presupposes an ability to deal more directly with the quality in contrast to the quantity of education, and it is in this context that I consider the future and potential contributions of vocational and workforce education. I have been impressed with the potential for vocational and workforce education to contribute to the economic wellbeing of individuals as well as nations, and I deal explicitly with the steps that need to be taken to more fully realize this potential for the future.

2. BACKGROUND

Conceptual Underpinnings

It has been widely observed and indisputably demonstrated that positive correlations exist between levels of education attainment and conventional measures of economic activity. In particular, substantial proportions of differences among and within countries in average labor productivity, poverty alleviation, economic growth, and social mobility have been linked to differences in education attainment. These relationships have been shown empirically using output accounting exercises (see Knight and Sabot, 1987 and Krueger, 1968); micro wage function estimates (see Behrman, 1990; King and Hill, 1993; Psacharopoulos, 1994 and King and Hill, 1993); and cross-country regressions (see Barro, 1991; Barro and Lee, 1993 and Birdsall and Sabot, 1994).

More in dispute are the various conceptual views that have been offered about "why" these relationships exist. The following three alternative, although not altogether inconsistent, points of view have emerged in the literature.

Human capital theory. According to the human capital point of view, positive relationships exist between education attainment and economic indicators like earnings because education enhances capabilities which subsequently command returns in labor markets. The crux of the matter is that students learn things in educational institutions like schools that are economically valuable. The inter-temporal nature of the relationship is consistent with the idea of capital and investments. Costs are incurred early (both in terms of the time that is required to go to school by the students and in terms of the out-of-pocket costs that are incurred to provide the teachers, facilities, supplies, and other components of a school), and streams of benefits are realized later. These benefits can accrue to individuals in the form of enhanced earnings; they can also accrue more broadly to the society and give rise to economic growth for the society as a whole. In its most complete version, human capital theorists hold that students and/or their surrogates (e.g., parents or guardians) make decisions about how much and what type of schooling to acquire in part because of anticipated returns relative to costs. Theodore Shultz and Gary Becker are most prominently associated with the human capital school of thought and conducted their pioneering work at the University of Chicago, beginning in the 1960's (Becker, 1964 and Schultz, 1961).

Screening theory. Proponents of screening theory hold that these widely observed relationships are due not so much to a productivity enhancing function of schooling as they are due to the tendency for schools to reveal the existence of valuable but pre-existing traits embodied within their clients. According to an extreme version of this view, schools do nothing to enhance capabilities. Instead, they signal to prospective employers that those who graduate have certain capabilities and traits that were acquired either prior to coming to school or in some fashion that is peripheral to the schooling experience. Those who challenge screening theory ask questions like why it is that employers rely on schools to signal these capabilities rather than rely upon assessment devices that would presumably be less expensive and time consuming. Proponents of screening theory are quick to point out that because schooling is typically so heavily subsidized, firms do not bear the costs of schooling directly and that it may actually be more cost effective for them to rely upon schools to do the screening. See Grubb (1993); Katz and Ziderman (1980); and Rumberger(1987) for additional information about screening theory and efforts to estimate the magnitude of its significance.

Marxist theory. The education-earnings relationship can also be explained from more of a Marxist perspective (Bowles and Gintis, 1975). Here the idea is that schooling serves a social reproduction function that has several parts. On the one hand, schooling serves to legitimize economic inequality in the sense that it provides an answer to questions about why some individuals are more privileged economically relative to others. According to this view, what really explains economic success is the individual's family's social and class standing in the previous generation. Those who are privileged ensure that their heirs are aslo privileged and schools become devices to justify the differences that emerge.

On the other hand, schooling is also viewed as a mechanism that can be used to teach proper and class-specific behavior. Thus, the school also takes on a human capital function that is more than rhetorical. For students coming from working class background, the idea is that the school conveys skills and more importantly worker attitudes that keep the workforce docile and willing to work to the advantage of the more privileged groups in society. An important lesson for the less privileged members of society to learn, according to this view, is that their low placement in the economic order is largely due to their own inability to succeed in schooling. The Marxist view expects to see a highly differentiated schooling system with admission standards that serve to exclude "inappropriate" students from the elite schools. Denials of admission from the elite schools need to be viewed as creditable, and the "work hard without complaint" lessons being taught by the lower level schools need to be taken to heart. According to this view, schools become complicit in

reproducing the existing social order, an ironic result given the widespread rhetoric suggesting otherwise.

All three of the frameworks are attentive to the magnitude and nature of income inequality in nations, and one of the lessons being learned is that educational systems in many developing countries act to increase rather than decrease income inequalities (Alesina and Perotti, 1994; Bhagwati, 1973; Fields, 1997; and Jimenez, 1994). This effect can be understood as a byproduct of the positive correlation between the level of education and lifetime earnings and the limited access to secondary and higher educational opportunities for the poor due to financial or other reasons. Moreover, this inegalitarian outcome is reinforced by two economic factors. First, the private costs of primary education are higher for poor students because of higher opportunity costs due to availability of wages from child labor. Second, the expected benefits are generally lower for poor students. Together, these two factors lower the rate of return to education for poor families compared to other families.

Toward synthesis. Economists and others have been debating the relative merits of these alternative schools of thought for a number of years. It is difficult if not impossible to resolve the matter empirically given the absence of experimental data (Ashenfelter, 1991), and perhaps the most sensible conclusion to draw is that each approach enjoys some plausibility and captures elements of the complexity surrounding the connection between something as finely textured as "education" and the complexity of something we can refer to broadly as "economic outcomes." As our ability to differentiate between different qualities and types of education becomes better developed along with a parallel increased capacity to conceptualize and measure economic phenomena of interest, there is reason to be optimistic about gaining a better sense over time into the precise ways in which education contributes to the economic lives of people and nations.

Empirical Findings

George Psacharopoulos (1994) has provided periodic overviews of the vast empirical literature that examines links between education attainment and economic outcomes. Among Psacharopoulos's findings are the following: (1) Social and private rates of return for all levels of education tend to be inversely related to a country's per capita income; (2) Rates of return to education have been declining over time with the significant exception of higher education where increases are being observed; (3) Rates of return tend to be highest for primary education and lowest for higher education; (4) Returns to education tend to be higher for women compared to men; and (5) Returns to vocational education tend to be lower than returns to academic/general secondary education. These findings have had a powerful influence on policy making around the world. In particular, they have prompted large efforts to expand educational opportunities in developing countries. The findings have also prompted policy makers to place special emphasis on primary education, education for women, and academic rather than vocational education.

Results of these efforts can now be seen in various trend lines that are compiled by the World Bank and other agencies. For example, it is clear that the enrollment percentages of various school-age cohorts have been increasing for most, but not all, parts of the world. In particular, progress toward increasing the percentage of 6-11 year olds enrolled in schools has been particularly difficult to achieve in Africa (World Bank, 1999).

3. IMPLICATIONS FOR VOCATIONAL EDUCATION

The implications for vocational education are particularly significant. Economists, particularly those coming out of a neoclassical tradition, have tended to be critical of conventional vocational

education. Part of the hostility stems from these economists' attachment to human capital theory coupled with the respect neoclassical economists tend to harbor for free markets. These economists are wary of humankind's ability to plan something as complex as a modern industrial economy, and vocational education, at least in its traditional form, tends to fit with pro-planning kinds of thinking. An important traditional goal for vocational education has been to anticipate labor market needs and to sequence highly focused educational activities so that appropriate numbers of students with the appropriate kinds of skills are ready to enter labor markets in ways that bring supply into balance with demand.

Neoclassical economists tend to be skeptical of this kind of thinking. The alternative view is to place emphasis on types of education that are more broadly instrumental with the hope of promoting versatility and resiliency in students so that they can move from job to job in highly dynamic and difficult to predict labor markets. According to this way of thinking, the student who is more generally prepared and who acquires broadly applicable problem solving skills like basic literacy and numeracy is going to be the best positioned to thrive economically throughout his or her life. This kind of thinking has inclined human capital economists to see academic forms of education (where the presumption is that academic education is more broadly instrumental than traditional vocational education) as the better economic hope of developing nations.

The empirical literature regarding the economic returns to vocational education is instructive. In keeping with the human capital theorists' predilections, much of the research suggests that students receiving vocational education enjoy more modest returns to their education than do students who receive more academically oriented education. In the rate of return calculation both costs and streams of benefits are considered. Traditional vocational education has suffered on both counts, since it tends to be more costly than academic education and since the evidence suggests that the returns have been more modest. There are several possible explanations for why the returns have been modest: (1) the quality of the education may be low; (2) the quality of the education may be fine, but the match between the skills acquired and the nature of the job taken may be poor; and (3) the learning capabilities of the students involved may be problematic.

The last point about the capabilities of the students in vocational education is particularly significant and raises a troublesome methodological question about how rate of return studies are conducted for the education sector. An important goal in a rate of return study is to isolate the "value-added" by the type of education being studied. If it is the case that "more able" students are attracted into one type of education compared to another, there is a danger that some of the returns associated with "greater ability" could be wrongly attributed to the type of education rather than to the type of student. Suffice it to say that some of the premium attached to academic education in the empirical literature could stem from a failure to control perfectly for differences in the students across these areas of the curriculum.

In this context, it is interesting there is some recent evidence suggesting that economic returns to vocational education are higher than commonly supposed. In particular, Mane (1999) used several national longitudinal data sets from the U.S. and found that vocational courses had significant positive effects on the early economic successes of non-college bound students. He used his findings to conclude that employers value occupation specific skills and are not inclined to rely on the schools to provide students solely with general skills. While Mane's results are significant, he is comparing students taking vocational courses with those who are "non-college-bound." Selection effect issues are relevant here, just as they are relevant in the comparisons between students in vocational and academic tracks. Mane's results also need to be contrasted with other modern studies where the results are more in line with the conventional findings (e.g., Horowitz and Schenzler, 1999).

4. RESPONSES FOR THE FUTURE

We have entered a very challenging period of time for education throughout the world. In the United States, interest has been growing very rapidly in education and policy makers are making decisions that are holding educators increasingly accountable for achieving historically high outcome standards. The phrase "standard driven reform" is becoming common place throughout the nation, and it is clear that business as usual is not going to be acceptable.

We are also entering a period world wide where the results of some past policies have to be reckoned with. In particular, the rapid expansion of primary education has now set the stage for dramatically increased demands for secondary and post secondary education. It is at these levels that curricular diversification and the attendant divisions between academic, vocational, and technical courses of study come into play. Important decisions need to be made over the next ten years about how the learning needs of the influx of new students will be met. The economy is also changing dramatically. If anything, it is becoming more difficult to anticipate what the precise labor market skills today's young people are going to need for tomorrow's labor markets.

In light of these challenges, several things need to be done. First and perhaps most important, we need to develop in our youth an appreciation for learning along with the self confidence that students need to become life long learners. Learners need to be engaged with what they are learning, and modern vocational education as a type of education that is quite good at building and strengthening this fundamentally important appreciation for learning.

Second, we need to work at making education more relevant and connected to the real world. There are ways to do this without sacrificing academic rigor and standards. There is a growing appreciation in the broad field of education for the significance of experiential learning, and the very clear reality is that this is something people in vocational education and workforce education have been practicing and perfecting for years. Lessons have been learned within the field of vocational education that colleagues in other areas of the field need to know more about.

In particular, we need to reject the false dichotomy that has been used to characterize academic or general education in contrast to vocational or technical education. Policy makers are particularly guilty of using this dichotomy as a wedge in the United States, and there are important lessons to learn from other nations about how to more seamlessly introduce elements of both kinds of curricula into a common course of study.

Third, we need to be attentive to the development of skills that are broadly instrumental regardless of whether we are talking about academic or vocational education. We know labor markets are very fluid and we need to provide students with the skills they will need to take the next steps in their careers. We need to develop versatile labor forces around the world where people can adapt quickly to changing conditions. Vocational education as a field needs to evolve further in this direction and can thereby benefit from some of the lessons that can be learned from human capital theory.

Fourth, and finally, we need remember that it is important to develop a sense of commitment and a pride of workmanship in all learners. We need to develop in our youth that inner voice that gets a person out of bed on a cold, gray morning when the great temptation is to roll over and ignore the alarm. And we need to find ways to stimulate genuine pride in the job that needs to be done. The work ethic is something vocational educators know something about and there are important lessons to learn for the entire field of education. And there are ways to instill this kind of pride without succumbing to what the Marxist critics would hold is the de-humanizing nature of education that is geared to foster loyalty and obedience on the part of workers.

If these are the things we need to do, how do they compare with what is currently happening within the schools and the economy? As I look at the field, I see mixed results. On the positive side, I see considerable progress at expanding opportunities in terms of types of schools and approaches to learning. On the not so positive side, I see increasing evidence of an economy that operates with very sharp divisions between people who have certain skills and those who lack these skills. There seem to be fewer stepping stones between the "haves" and the "have nots," and this is worrisome.

In addition, schools seem to be evolving in ways where there are fewer opportunities for second chances. As we rely more heavily on high stakes testing, a course or examination failure becomes more serious and significant. Budgetary pressures are limited our ability to provide options for those who fall short of the standards, and the result may be an unsettling widening of inequalities that may or may not be merit based.

I also worry that we are becoming more and more pre-occupied with narrow measures of what we want students to accomplish. New York State, for example, has been moving very aggressively toward increased graduations requirements (Monk and Hussain, and Miles, in press; Monk and Hussain, 2000). I contrast this with the results of a series of focus groups that were conducted with parents and taxpayers throughout New York State. These respondents were asked what they associate most with high quality education. Interestingly, these respondents did not list high test score results and low taxes as their highest priorities. In contrast, they placed the most emphasis on the degree to which the school provided a caring environment and was able to attend to the individual needs of students (Monk, Nusser and Roellke, 1998).

The progress that is being make within vocational and workforce education has important implications for meeting these challenges both within education as a field and the larger economy. It will be important over the next ten years to take advantage of the progress that has been made toward expanding educational opportunities as well as the lessons that have been learned about better blending and taking advantage of the many complementarities that exist between vocational and other forms of education.

5. REFERENCES

Alesina, A. & Perotti, R. (1994). The political economy of growth. A critical survey of the recent literature. *World Bank Economic Review* 8.

Ashenfelter, O. (1991). "How Convincing is the Evidence Linking Education and Income?" Working Paper No. 292, Industrial Relations Section, Princeton University. Princeton, New Jersey, November.

Barro, R. J. (1991). "Economic Growth in a Cross Section of Countries," *Quarterly Journal of Economics* 106, 407-443.

Barro, R. J. & Lee, J. W. (1993). "International Comparisons of Educational Attainment," *Journal of Monetary Economics* 32, 363-394.

Becker, Gary S. (1964). *Human Capital* (New York: National Bureau of Economic Research).

Behrman, J. R. (1990). *Human resource led development?* ARTEP/ILO, New Delhi, India

Bhagwati, J.N. (1973). "ducation, Class Structure and Income Equality,"

World Development 1.

Birdsall, N. & Sabot, R. H. (1994). *Virtuous circles: Human capital, growth and equity in East Asia.* World Bank, Washington, DC. mimeo.

Bowles, S. and H. Gintis (1975). "The Problem with Human Capital Theory: A Marxist Critique," *American Economic Review* 65: 74-82.

Fields, G.S. (1997). "Accounting for Income Inequality and Its Change," Working Paper.

Grubb, W.N. (1993). "Further Tests of Screening on education and Observed Ability," *Economics of Education Review* 12,2: 125-136.

Horowitz, A.W.and C. Schenzler (1999). "Returns to General, Technical and Vocational Education in Developing Countries: Recent Evidence from Suriname," Education Economics 7,1 (April): 5-19.

Jimenez (1994). "Public Subsidization," *World Bank Economic Review* 8.

Katz, E. and A. Ziderman, (1980). "On Education, Screening, and Human Capital," *Economics Letters*, 6: 81-88.

King, E. M. & Hill, M. A. eds, (1993). *Women's education in developing countries: Barriers, benefits, and policies.* The Johns Hopkins University Press, Published for the World Bank, Baltimore and London.

Knight, J. B. & Sabot, R. H. (1987). "Educational Policy and Labor Productivity: An Output Accounting Exercise," *Economic Journal* 385, 199-214.

Krueger, A. O. (1968). "Factor Endowments and Per Capita Income Differences Among Countries," *Economic Journal* 78, 641-659.

Mane, F. (1999). "Trends in the Payoff to Academic and Occupation-Specific Skills: The Short and Medium Run Returns to Academic and Vocational High School Courses for Non-College-Bound Students," *Economics of Education Review* 18: 417-437.

Monk, D.H., S. Hussain, and W. Miles (in press). "Accounting for the Effects & Increased High School Graduation Expectations on Pupil Performance and Resource Allocation: Results from New York State," *Economics of Education Review*.

Monk, D.H. and S. Hussain (2000). "The Implementation of Demanding High School Graduation Requirements: An Update from New York State," Paper presented at the New York State Board of Regents Symposium on Education Finance, Albany, New York, May.

Monk, D.H., J.L. Nusser, and C.F. Roellke (1998). "Resource-Based Indicators for Educational Accountability and School District Improvement," *Education and Urban Society* 30, 4 (August): 479-501.

Psacharopoulos, George (1994). "Returns to Investment in Education: A Global Update," *World Development* 22,9: 1325-1343.

Rumberger, R. (1987). "The Impact of Surplus Schooling on Productivity and Earnings," *Journal of Human Resources* 22,1: 24-50.

Schultz, T.W. (1961). "Investment in Human Capital," *American Economic Review* 51 (March): 1-17.

World Bank (1999). *Education Sector Strategy*. Human Development Network Series. Washington, D.C. Author.

ICT-SUPPORTED DEVELOPMENT OF COMPETENT SKILLED WORKERS AND PROFESSIONALS

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Index: ICT-supported learning, globalisation, vocational education and training

Abstract: Information technology has profoundly reshaped the occupational structure as a whole as regards both occupational classifications and occupational profiles. On the global level, a disadvantage of the growth of information technology is the increasing imbalance between developed and developing countries. My presentation focuses on the function of and the preconditions for applying information technology in the context of education and training, on the application of information technology in the production and dissemination of knowledge and, as a case study, on how the Finnish educational system is preparing for the challenges posed by the information technology of the 21st century.

INTRODUCTION

An information or knowledge society is characterised by the unparalleled growth of information and the informatisation of society. Informatisation is inextricably linked with technological development. A synthesis of computers and telecommunications has given birth to a knowledge network linking schools, homes, workplaces, banks and shops on a national, continental and global level. The new technology has also affected the economy as a whole, the changes occurring both in occupational structures and in the content of work, and the new forms taken by information flows. Information technology has profoundly reshaped the occupational structure as a whole as regards both occupational classifications and occupational profiles. Many occupations have seen a rise in the use of information technology in the last few decades. In Finland for example, in 1984 information technology was used on the job by 17 per cent, in 1997 by 66 per cent of wage and salary earners. In addition, a great proportion of the working population consist of information workers. In Finland for example, not quite a third of the workforce was information workers in 1980, while in 1997 the figure was 44 per cent (Statistics Finland, 1997).

At the moment there are extensive programmes in most industrialised countries intended to boost the development and introduction of information technology and promote its application to the operations of society. The introduction and utilisation of information technology is seen as a central national-level strategy. Such countries as the United States, Finland, Japan, the UK, Germany, Canada, Sweden, Norway, Denmark, Singapore, France, Spain and South Korea have found common development targets, such as information technology at schools, health services, and promoting multimedia. Shared trends discernible in knowledge-society strategies adopted and action programmes launched in different countries include

- increasingly versatile and integrated networks;
- simpler architectures (web computers);
- commercialisation of the Internet;
- a need to regulate the market;
- increasing electronic commerce.

At the Lisbon European Council held in March 2000, the Heads of States and Governments acknowledged that the European Union is confronted with a quantum leap coming from globalisation and the new knowledge-driven economy and set the Union, among others, a strategic goal to develop *e*Learning (European Commission, 2000). *E*Learning seeks to mobilise the education and cultural communities, as well as the economic and social players in Europe, to speed up changes to move to a knowledge-based society. The European Union has undertaken extensive measures in the field of knowledge-society policies. This expansion is due to the inclusion of many emphases of R&D activities into knowledge-society policies. A plan drawn up in 1994 started with the most basic considerations such as deregulation and creating a market. Information technology was presented as a means of promoting economic growth and creating new jobs. The current programme stresses social questions, such as acceptance of the information or knowledge society in different population groups and the prevention of polarisation.

As for the OECD's (Organisation for Economic Co-operation and Development) activities related to the knowledge society, their focus is on reforming the relevant legislation and the public administration, on formulating political targets for a knowledge society, and on international co-operation. The OECD distinguishes four categories of information workers: producers, processors and distributors of knowledge, and people in support services.

The growth and wide distribution of information do not in themselves indicate the function and quality of knowledge. In public debates, the concept of the knowledge society has been joined by that of the learning society. The *White Paper on Education and Training* by the European Commission considers the construction of a learning society an indispensable precondition for making good use of the globalised economy, the development of the knowledge society and the growth of scientific knowledge, and for averting the risks that these processes give rise to. A factor that must also be taken into account on the global level is the increasing imbalance between developed and developing countries created and promoted by information technology.

My presentation focuses on three subjects: (1) applying information technology in learning an occupation, (2) applying information technology in the production and dissemination of knowledge on development of vocational education and training and, as a case study, (3) how the Finnish educational system is preparing for the challenges posed by the information technology of the 21st century.

ICT IN THE CONTEXT OF EDUCATION AND TRAINING

Researchers of pedagogy have discussed ways of restructuring the teaching and learning practices of school so as to make them more supportive of the development of the information-processing skills characteristic of experts or competent workers. These discussions emphasise the importance of ICT.

The new information and communications technology make it possible to develop cognitive practices of a kind that guide students towards the acquisition of the progressive problem-solving skills characteristic of a competent professional (eg the computer-supported intentional learning environment CSILE developed at the University of Toronto, WorkMates, developed at the Centre

for Learning Research of the University of Turku, and Future Learning Environments, developed by the University of Art and Design Helsinki in collaboration with the Department of Psychology of the University of Helsinki) (Lehtinen, 1997). Cognitive practices developed through ICT support problem-centred studying that can be brought closer to various occupational practices (for example by applying the model of research-based learning). ICT can also foster studying aiming at learning and understanding. Learning is motivated particularly by technology that makes it possible to organise individualised work processes, varying task contexts and links with society's authentic occupational environments. Network-based action models and new technologies enable students to move, in a natural and relevant way, between school and the institutions of the surrounding society. This has meant the expansion of learning environments beyond the confines of school to occupational activities and contexts outside formal education.

ICT has expanded our learning environments. In order to ensure that ICT will support conscious and high-quality learning we need to analyse conceptions of learning as a starting point for network pedagogy. According to Erno Lehtinen (1997), network pedagogy is based largely on the central ideas of the last few years' research on learning. He characterises learning as the, among other things, constructive, structural, self-directed, goal-directed, situation-specific, and collaborative processing of knowledge. Learning should be seen as the active construction of knowledge and skills rather than as the passive reception and storing of information. Because the acquisition of knowledge and skills is an active process initiated and maintained by the learner, the information transmitted affects the course of learning only indirectly. Drawing on their previous knowledge, learners actively observe phenomena, process the new knowledge that they encounter and construct, as a result, new meanings and structures.

Learning does not necessarily involve an increase in knowledge elements in students' minds but, instead, a gradual transformation of cognitive structures. In the course of their learning history individuals develop rather abstract and general assumptions and beliefs about the nature of things. These in part unconscious framework theories guide and direct learning. This feature of learning is emphasised also when operating within networks. Knowledge is retrieved and interpreted on the basis of the learner's earlier knowledge and beliefs. Metacognition and self-directness are skills acquired through learning and practice. Metacognition is an ability to be aware of one's own cognitive processes and to guide and monitor ones' own intellectual performance. The more self-directed learning becomes, the more responsibility learners themselves take for their learning.

Goal direction in teaching and learning is probably a self-evident principle. What is not self-evident is how far and at which point the student should be allowed to themselves define learning targets. Information networks provide an open learning environment where students can, under their own direction, carry out research and studying processes to reach targets set by themselves. This prevents purposeless wandering in information jungles.

Situation-specific learning is linked with a particular social and cultural situation. In this context, learning is seen as changes in individuals' participation in the activities and practices characteristic of a given culture. Situation-specific learning calls into question institutional education and learning taking place in isolation from the situations where knowledge is applied in practice. Computers and information networks enrich school-based learning by making possible virtual participation in activities that would otherwise be beyond reach.

The role of social interaction in learning has been emphasised for a while. Different cultural traditions exert an important influence on the nature of the social interaction that emerges in learning environments and on how it affects learning. Collaborative learning implemented through information networks offers a range of flexible approaches to using various forms of communication. The rapid development and expansion of ICT have led to global networking and,

as a result, to a new kind of communication culture in studying. The emerging communication cultures provide challenges to the future studies of network pedagogy.

As regards the development of teaching and learning practices, information technology is both a potential tool and a challenge. How can we exploit information technology to foster the growth of competent skilled workers and professionals and the development of their information-processing skills? Technology-based learning environments can promote (a) research-based learning and problem-solving, (b) the development of students' self-evaluation skills and other metacognitive skills, (c) the formation of motivation, (d) organisational learning and (e) closer ties between the culture of school and the culture of the workplace. As mentioned above, the learning society has recently emerged as a concept used alongside that of the knowledge society. Lifelong learning and, in this context, making use of information technology to support learning in all age groups, has become an increasingly important consideration. Pelgrum and Anderson (1999) coordinated the international study among twenty-six countries on the educational assessment of ICT infrastructure, goals and practices in the context of International Education Attainment (IEA) studies. Students at primary, lower secondary and upper secondary education levels experienced most satisfying of the learning activity involving computer-related technology concerning their information-processing, production and communication/collaboration activities.

Constructing networks and communities supporting lifelong learning with the aim of enabling local and global enterprises and communities and different work cultures to contribute to the learning projects of educational establishments may be considered a central strategy for developing the pedagogy of vocational education and training. Developing a knowledge and learning society to meet human and societal needs poses a challenge particularly as regards the creation and maintenance of learning networks using ICT.

A NATIONAL CASE OF PREPARING FOR ICT OF THE 21ST CENTURY

In a knowledge society, knowledge is an important resource. The development of the techniques of producing and transmitting knowledge exerts an essential influence on the structures and contents of and the working methods used in education and research. In Finland, knowledge-society policy has been implemented on the basis of two extensive strategy documents, *Koulutuksen ja tutkimuksen tietostrategia* (official English translation: *Education, Training and Research in the Information Society)* and *Kulttuurinen tietoyhteiskunta* (*A Cultural Information Society)*. In education and research the knowledge society is being implemented through the gradual digitalisation of the cultural capital that makes new information and communications technology possible and the provision of a more versatile and equal access to it.

The first knowledge strategy for education and research in Finland, covering the years 1996-1999, was formulated by the Ministry of Education in 1995. The current strategy was devised for the period 2000-2004. The Government's aim is to use information technology to promote employment and national competitiveness and to ensure that citizens have access to and can exploit knowledge and that they possesses the basic skills in using knowledge and information technology. The strategy also proposes measures to guarantee high-performance computing capacity with a view to supporting scientific research and improving the preconditions of producing and using network-based multimedia. The Ministry of Education (1999) defined its vision of developing a knowledge society as follows:

> By the year 2004 Finland will be one of the leading knowledge and interaction societies. Success will be based on citizens' equal opportunities to study and develop their own knowledge and extensively utilise information resources and educational services. A high-

quality, ethically and economically sustainable mode of operation in network-based teaching and research will have been established.

The overall theme of the strategy, the systematic development of learning environments based on research, can be divided into six subthemes:

- provision of information-society skills for all;
- the information-society skills of educational staff,
- the knowledge of professionals in the information and content industries;
- the consolidation of virtual learning environments;
- electronic publication, classification, and distribution of research information and teaching materials;
- strengthening the structures of the knowledge society.

The strategy draws guidelines for an information and knowledge policy for the 21st century by proposing 85 detailed strategic measures. The following measures stand out as central goals:

- Once-and-for-all education is replaced by continuous, lifelong education
- Everyone is ensured the acquisition of the basic skills needed in an information society
- Vocational education and training is guaranteed to deliver information-society skills that meet the requirements of a networking, constantly changing and increasingly global working life. The competencies of different knowledge workers are developed in the direction of the multi-disciplinarity presupposed by the changing contents of jobs.
- The preconditions and contents of teachers' pre- and in-service training are developed to meet the requirements of the emerging knowledge society.
- Support is given to the development of knowledge products and services.

In a knowledge society, the development of research activities is guaranteed among other things by seeing to it that the equipment needed for scientific computing is kept up to date. At the same time, encouragement is given to research on the political, social and cultural effects of a knowledge society.

The school system and the library network as a whole will be rapidly linked with the services provided by information networks. All educational establishments will be guaranteed a minimum level of services, while an education and research information network will be constructed as a part of a global open information network along the lines suggested by the present Internet and the standards of the emerging broadband networks and services.

Expanding use of information technology affects also culture profoundly. The report *A Cultural Information Society*, completed in 1996, outlines a developmental strategy for cultural policy in a an information or knowledge society by considering how the new technology influences the various areas of culture and what kind of trends can be discerned and anticipated in the near future. The strategy covers the following central considerations arising in an information society:

- provision of native contents;
- access to culture, regional policy and equality;
- new products and new services;
- international opportunities.

It also presents a number of theses as a basis for the cultural political measures proposed:

- Culture promotes the economy, employment and competitiveness.
- Culture promotes technology.
- Culture promotes democracy.
- Culture prevents exclusion.

The starting points of developments towards a knowledge society are often linked with the development of ICT, but quality of life should not be forgotten among its aims. The Finnish Ministry of Education (1999) emphasises a vision of an information society providing a high quality of life. In an endeavour to develop an information society characterised by a high quality of life, the following considerations are foregrounded:

> People's real needs must be made the starting points for developing an information society. There must be more high-quality pedagogic and cultural contents on information networks. Instead of the emphasis being on an information society as such, it must lie on a learning society and an understanding-oriented society. Information technology should serve as a tool helping to develop people's ability to criticise, select, use and apply knowledge and to process it further and turn it into new products.

ICT should be based on faith in the power of education. It must be used to look for means of promoting parents' and schools' ability to bring children and young people up as human beings who can make ethically valid choices and distinguish between right and wrong.

- An information society that violates privacy should not be allowed to emerge.
- Both the advantages and the social and psychological disadvantages of communication over telecommunications networks must be recognised. The emerging division into knowledge-rich and knowledge-poor areas should be prevented.
- New information and communications technology must be developed particularly with a view to guaranteeing various minority and special groups, such as the disabled or people living in outlying areas, a good life and equal participation.
- In teaching and training, new technology must be exploited to support learning that is individualised both in its forms and in its contents.
- In developing an information and learning society, support must be given, apart from the technological sciences, particularly to research on the information of knowledge society within the humanities and the social sciences.
- An information society is seen, from the perspectives of education, research and culture, as the richness of individual diversity and as an opportunity for individually defined quality of life.

The Information Strategy Group of the Ministry of Education monitored the implementation of the strategy in 1995-1999, and the Finnish National Fund for Research and Development (Sitra) was also commissioned by the Parliament to assess its implementation through a national evaluation of the educational use of ICTs (Huovinen, 1998; Lehtiö, 1998; Sinko & Lehtinen, 1999). Harnessing new technology to support education and learning has had a positive effect. However, universities and other educational institutions have used the new educational technology in quite heterogeneous ways. Likewise, there have been marked differences in the degree of commitment to the strategy. Only a fifth of the educational staff uses new technology extensively in their teaching. Almost all teachers and students would be willing to make more use of it in teaching and studying. The

majority of the appropriations made for developing an information society were intended to finance the acquisition of equipment by and the building of information networks in schools, colleges, universities, libraries and archives. There were also appropriations for strengthening education, training and research related to the information or knowledge society by increasing the student intake and the number of teachers and researchers. Internationally, the measures undertaken in Finland to develop an information society represent a high standard. In a survey conducted in 55 countries in 1997, measured by social, communicative and information technology parameters Finland ranked second after the United States (Statistics Finland, 1997).

ICT IN THE PRODUCTION AND DISSEMINATION OF KNOWLEDGE

In recent years, the development of computer technology, diverse user applications and the experiences with collaborative research and development projects and networks have created a new situation characterised by decentralised and dispersed structures of knowledge logistics, electronic communication and virtual networking. The first step towards the new era involved the development of web pages and the correspondingly varied uses of electronic publication and communications media. Gradually, a number of new structures and environments have emerged to meet the needs of electronic communication and knowledge sharing among research communities that are developing collaborative research patterns. Alongside needs arising in the research communities, new providers have emerged to develop simple gateway services and user-friendly overviews of current research (see Manning & Lasonen, 1999; Manning, 2000). At the same time other new providers have emerged to develop electronic communications and knowledge sharing environments for European projects and networks (see Attwell, 2000; Brown & Attwell, 1999). Finally there is the emergence of project-related initiatives to develop telematic tools for the contextualisation and enrichment of interim research results and for the further processing of knowledge.

According to Kämäräinen (1999) CEDEFOP's (*European Centre for the Development of Vocational Training*) activities have been shaped in a number of evolutionary phases, and only some of them are directly related to a repositioning between European programmes, research communities and European projects. CEDEFOP launched a new interactive communication infrastructure, the Electronic Training Village (ETV) in 1998. At the same time, the ETV is related to the progress that CEDEFOP has made with independent research cooperation networks in the context of the joint development of telematic tools for knowledge sharing and electronic research communication. Success in this field has been essentially based on the participative accompaniment and synergy-promoting measures that have linked CEDEFOP with a number of major European projects and networks. Synergetic collaboration between ETV and related initiatives by independent networks led to a qualitatively new stage characterised by the preparation of a new framework to support research cooperation, knowledge sharing and knowledge utilisation, the CEDEFOP Research Arena (CEDRA). The central function of CEDRA is the production of instruments (overviews, research resource bases) for collaborative knowledge sharing in particular fields of research and development. These should not seen as a means of warehousing knowledge but as one of the interactive processing of knowledge. The related knowledge management, knowledge processing and knowledge transfer tools (metadata, mapping tools, visualisations of problem structures and relevance structures) should not merely illustrate the current stand of research-based knowledge. Instead, they should challenge producers and users of knowledge to discuss problem structures, relevance structures and principles of transformation in the context of knowledge utilisation.

On the basis of these trends it is possible to draw some tentative conclusions about the reposition-

ing of CEDEFOP within European VET-related research and development cooperation:

- CEDEFOP can be considered both an actor in European VET research and a partner in promoting European research culture with supporting services.
- The support that CEDEFOP can provide to European VET research and related knowledge utilisation can be based on the development of infrastructures for knowledge processing and knowledge transfer.
- The development of such infrastructures does not involve merely technical applications of ICT but, rather, the collaborative participation of CEDEFOP in debates on contextualisation, enrichment and regeneration of research-based knowledge about VET.

INTELLECTUAL PROPERTY RIGHTS

The development of a knowledge society and information technology is a global process. The problems involved in digital environments are not problems of individual countries. Their solutions must be found through international harmonisation. Copyright has traditionally been an international branch of jurisdiction. Copyright and neighbouring rights are governed by several international conventions. Attempts to meet the needs to develop and harmonise copyright legislation that arise from information networks and digital technology have been made both on a global level and within the EU

The World Intellectual Property Organisation (WIPO) has for years worked for a reform of international copyright treaties. Its copyright treaty, concluded in Geneve in 1996, and performances and phonographs treaties set down the first international rules for copyright in the digital age and for using works on information networks. The WIPO treaties recognise the following rights:

> Copyright protection generally means that certain uses of the work are lawful only if they are done with the authorization of the owner of the copyright. The most typical are the following: the right to *copy or otherwise reproduce* any kind of work; the right to *distribute* copies to the public; the right to *rent* copies of at least certain categories of works (such as computer programs and audiovisual works); the right to make sound recordings of the performances of literary and musical works; the right to *perform in public*, particularly musical, dramatic or audiovisual works; the right to communicate to the public by cable or otherwise the performances of such works and, particularly, to *broadcast*, by radio, television or other wireless means, any kind of work; the right to *translate* literary works; the right to rent, particularly, audiovisual works, works embodied in phonograms and computer programs; the right to *adapt* any kind of work and particularly the right to *make audiovisual works* thereof (World Intellectual Property Organization, 2000).

Both agreements also include measures intended to protect digital materials and regulations concerning rights management information.

The European Union issued its directive about the legal protection of databases (96/9/EU) on 11 March 1996. The EU Commission issued on 20 November 1996 a communication to the European Parliament on developing and harmonising copyright in the context of encouraging electronic commerce (COM (96) 568 final). The communication is based on the Green Paper on copyright and neighbouring rights in the information society issued by the Commission on 19 July 1995. The

communication presents the Commission's views on the future harmonisation needs and priorities in the field of copyright.

PROBLEMS OF ICT

To return to a more general consideration of the issues involved, in developing knowledge-society policies particular attention should be paid to the following considerations:

- preventing exclusion;
- recognising the teacher's changing professional role;
- preparing for the establishment and development of virtual schools;
- mastering the information overload;
- supporting evolution of indigenous cultures;
- guaranteeing the preconditions of acting as a critical citizen in a knowledge society;
- allowing for individual learning needs and styles as a starting point for education;
- teaching students versatile media readinesses on all levels of the educational system;
- preventing inequity between the industrialised and emergent countries; and
- considering gender inequity in using the resources of ICT.

There are a number of general ICT-related skills that are indispensable in a knowledge society. In the near future, the following skills will be foregrounded as basic media readinesses entailed by communications technology:

- using e-mail;
- using information search and retrieval systems;
- systematic distance education over information networks;
- assessing the reliability of knowledge;
- being able to use audiovisual methods and materials in one's occupation.

As their most general readinesses, people living in a knowledge society need communication skills, an ability to cope with change, an ability to learn, an ability to think ecologically, tolerance for diversity, and solidarity.

The civic skills possessed by the citizens of a knowledge society must meet the requirements of a networking, constantly changing and increasingly global life style but be based on independent initiative, self-directedness, understanding, and independent search for knowledge. Such civic skills include technical skills, communication skills and a network ethics, the skills needed in acquiring and using information, consumer skills, and influencing knowledge-society policies. On the global level the contents and relative priorities of these goals will vary. As it is, there is little balance in the way such goals are materialised. The rich industrial countries should assume some of the responsibility for preventing ICT from becoming one more factor creating inequality on earth.

REFERENCES

Attwell, G. (2000). *Information and communication technology and vocational education and training: Background and context* [Online]. European Center for the Development of Vocational Training (CEDEFOP) TELEVET project. Available: http://www.trainingvillage.gr/etv/ict/ [2000, June 15]

Brown, A.,& Attwell. G. (1999, September). *Computer-mediated collaboration and knowledge transformation for the European vocational education and training research community.* Paper presented at the ECER99 European Conference on Educational Research (VETNET 99 Strand). Lahti, Finland.

European Centre for the Development of Vocational Training. (2000). Training Village [Online]. Thessaloniki: Author. Available: http://www.trainingvillage.gr [2000, June 15].

European Commission (1996). *White paper on education and training. Teaching and learning. Towards the learning society.* Brussels: Commission of the European Communities.

European Commission. (2000). *e*Eupore 2002: An information society for all. Action Plan prepared by the Council and the European Commission for the Feira European Council 19-20 June 2000. [Online]. Brussels: Council of the European Union. Available: http://europa.eu.int/comm/information_society/eeurope/actionplan/index_en.htm [2000, June 15].

Fabos, B., & Young, M.D. (1999). Telecommunication in the classroom: Rhetoric versus reality. *Review of Educational Research, 69*(3), 217-257.

Finnish Ministry of Education (1999). Education, training and research in the information society. A national strategy for 2000-2004 [Online]. Helsinki: Author. Available: http://www.minedu.fi/julkaisut/information/englishU/welcome.html [2000, June 15].

Huovinen, L. (Ed.). (1998). *Peruskoulujen, lukioiden, ammatillisten oppilaitosten ja varhaiskasvatuksen nykytilanne ja tulevaisuuden näkymät. Sitran teknologia-arviointihanke: Tieto ja viestintätekniikka opetuksessa ja oppimisessa. Osaraportti 3* [Comprehensive schools, upper secondary schools, vocational institutions and early childhood education: current situation and future prospects. The Sitra technology assessment project: Information and Communication Technologies in Teaching and Learning. Interim report 3.] (SITRA 191). Helsinki: Sitra

Jager, A.K., & Lokman, A.H. (1999, September). *Impacts of ICT in education. The role of the teacher and teacher training.* Paper presented at the ECER99 European Conference on Educational Research (VETNET 99 Strand). Lahti, Finland.

Kämäräinen, P. (1999, December). *The role of research in supporting vocational education and training – Reflections on current European development.* Keynote presentation at the Annual Congress of the Association for Career and Technical Education (ACTE/IETA). Orlando, Florida.

Lehtinen, E. (1997). Tietoyhteiskunnan haasteet ja mahdollisuudet oppimiselle [Information society and learning: challenges and possibilities]. In E. Lehtinen, (Ed.), *Verkkopedagogiikka* [Network pedagogy] (pp. 12-40). Helsinki: Edita.

Lehtiö, P. (1998). *Tietoverkot ja digitaaliset oppimateriaalit. Sitran teknologia-arviointihanke: Tieto ja viestintätekniikka opetuksessa ja oppimisessa. Osaraportti 5* [Information networks and digital study materials. The Sitra technology assessment project: Information and Communication Technologies in Teaching and Learning. Interim report 5 (SITRA 193). Helsinki: Sitra

Manning, S. (2000). *European research overview (ERO)* [Online]. Available: http://www.b.shuttle.de/wifo/vet/ero.htm [2000, June 15]

Manning, S., & Lasonen, J. (1999). *Enhancing the attractiveness of vocational education: A knowledge base on Finnish and European experience*. [Online]. Available: http://www.jyu.fi/finnbase [2000, June 15].

Pelgrum, W.J., & Anderson, R.E. (Eds.). (1999). *ICT and the emerging paradigm of life long learning: A worldwide educational assessment of infrastructure, goals and practices*. Enschede, the Netherlands: OCTO, University of Twente.

Sinko, M., & Lehtinen, E. (Eds.). (1999). *The challenge of ICT in Finnish education*. Jyväskylä: Atena.

Statistics Finland (1997). *Tiedolla tietoyhteiskunta* [Through knowledge to the knowledge society]. Helsinki: Author.

World Intellectual Property Organization. Intellectual property: About copyright and neighboring rights. In *World Intellectual Property Organization: An organization for the future* [Online]. Available: http://www.wipo.org/eng/main.htm [2000, June 25].

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WHITHER VOCATIONAL EDUCATION?

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INTRODUCTION

Hong Kong is in the latter stages of a major review of its education system. The review's recommendations are likely to be implemented during the next five years, and if so, they will cause radical changes to Hong Kong's education system.

Bearing in mind that Hong Kong is a major player in world markets, the skills and expertise of its workforce are crucial to its international activities and to those with whom it does business. Consequently, it is very important for its education reforms, not only to improve general education and create new educational opportunities, but also to ensure that the system is able to provide young people with the knowledge and skills for employment and to prepare them for the world of work. Education reforms ignore these aspects of the system at their peril.

SUMMARY

Initially, in this paper, I shall provide a brief description of Hong Kong's current education system, and, in particular, how vocational education and training fits into it. This will be followed by a summary of the proposed education reforms and how they might affect the system, in particular, the introduction of Associate Degrees. Then, I shall discuss the place of vocational education and training in the reformed system, and finally, consider aspects of the future of organisations like the Vocational Training Council (VTC) in societies planning or implementing similar reforms.

THE PRESENT EDUCATION SYSTEM

Currently, the primary and secondary school system in Hong Kong comprises nine years of compulsory education, students being able to leave school after a secondary 3 education at about 15 years of age. The majority of young people continue with school education until at least secondary 5, at this stage they take Hong Kong Certificate of Education Examinations (HKCEEs), success in which can enable them to enter a two-year course leading to the Hong Kong Advanced Level Examinations (HKALEs), or to enter Diploma and Higher Diploma courses offered by the Vocational Training Council, City University of Hong Kong(City U) and Hong Kong Polytechnic University (Poly U).

The major provider of vocational education and training is the VTC which educates and trains around 120,000 students annually. It provides courses for 'non-academic' secondary 3 and 5 school-leavers, for secondary 5 school leavers with five or more HKCEE passes and for in-service trainees. Its highest level mainstream course is the sub-degree, Higher Diploma, success in the HKALE enables young people to compete for places on degree courses in Hong Kong's universities. A

number of those who are unsuccessful in their HKALEs seek entry to Higher Diploma courses. (Diagram 1.)

THE EDUCATION COMMISSION REVIEW

The present review of Hong Kong's education system, which is being carried out by the Government's senior advisory body on education, the Education Commission (EC), has been accompanied by wide consultation and discussion over the last two years. It has now published its proposals for reform*.

The EC's review has been very wide-ranging and covers nearly the whole spectrum of Hong Kong's education system. Briefly, the main areas proposed for reform are as follows:

a) curriculum (at all levels);
b) assessment mechanisms;
c) obstacles to learning in the system;
d) the university admission system;
e) post-secondary learning opportunities; and
f) the application of resources.

Nevertheless, the EC Consultation Document does not address vocational education and training as a sector, and does not refer to it for reform. It also places great emphasis on student development particularly in terms of all-round abilities and positive attitudes, in preparation for life-long learning, and the importance of comprehensive and balanced learning attitudes, but places little emphasis on the role of education and training for employment.

For the purpose of its paper, I will only concentrate on the features which may affect significantly the shape and direction of post-secondary education, particularly in the vocational sector.

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*Note: *Review of Education System: Reform Proposals: Consultation Document* Published by the Hong Kong Special Administrative Region of The People's Republic of China, Education Commission

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Two main themes are very evident in the proposed reforms, first, the broadening of the education system to encourage the all-round development of the individual, and, secondly, creating more opportunity for education through life-long learning and clear progression paths (a 'seamless' system) to further education and qualifications.

Let us examine some of the more practical aspects of the proposed reforms which relate to these themes and explore how they may affect the future of the vocational sector. Diagram 2 summarises the proposed new system and the features of it which affect the shape of the post-secondary sector, the most significant are as follows:

a) the introduction of three years of senior secondary education in place of the current five years of secondary education;

b) replacing the two secondary examinations, HKCEEs (form 5) and HKALEs (form 7) with one secondary 'leaving' examination at form 6;

c) the introduction of Associate Degrees;

d) the addition of a new first year for university degrees to become four years of full-time study;

e) the implied inclusion of vocational education in the full-time post-secondary (community) college sector.

Apart from the fact that the review does not seem to address vocational education and training, one of the most significant effects of the proposed reforms on the vocational sector is likely to be the introduction of Associate Degrees in a 'seamless' education system. To consider this further it is necessary to be clear about the nature of sub-degree education in Hong Kong (that is education offered through the Higher Diploma), and this is described in the next section.

HIGHER DIPLOMAS AND ASSOCIATE DEGREES

The Higher Diploma (HD) in Hong Kong currently has over 12,000 students studying on it annually. Just over half of the HD places are provided by the Vocational Training Council, the rest are provided by the City University of Hong Kong (City U) and the Hong Kong Polytechnic University (Poly U).

In Hong Kong, the HD is a terminal qualification originally introduced to provide a course of study which educates and trains 'higher technicians' for commerce and industry. It has been designed as a three-year, full-time course with a five HKCEE entry, or a two-year, full-time course with a (one) HKALE entry.

It was never intended to articulate with degree programmes, however, in recent years there has been a tendency for more HD graduates to seek entry to degree programmes, normally, obtaining credit for their HDs such as they are able to enter the second year of a relevant three-year, full-time degree programme.

The EC's reform proposals encourage the universities in Hong Kong to develop new post-secondary sub-degree courses which can fit into a 'seamless' system allowing progression onto degree courses. These new courses, the Associate Degrees, can be two or three years full-time equivalent according to the level of entry qualifications. They are planned to fit into a progression ladder to provide the system shown in Diagram 2. One of the two universities currently offering HDs, namely, City U has already announced that Associate Degree courses will 'replace' their Higher Diploma programmes. In addition, continuing education providers such as Hong Kong University's School of Professional and Continuing Education (SPACE) are now offering Associate Degree as a pre-degree qualification. (See Annex).

The concept of the seamless life-long learning approach is laudable, but experience in other economies shows that if operated too comprehensively, it could lead to a lack of focus, and weaken the vocational sector. To illustrate this consider the current introduction in Hong Kong of Associate Degrees as part of the new seamless higher education system, as follows.

To be part of the system, Associate Degrees must be designed to fit the profile of the first two years of a four-year degree programme. This makes it difficult for them to be terminal qualifications, and eliminates the possibility of them being designed for employment and to be directly applicable to the needs of industry and commerce.

Let us now examine the future of the Higher Diploma once the Associate Degree has been introduced. It has already been pointed out that City U will replace its Higher Diplomas by Associate Degrees. In this context, it is important to realise that most young people who perform reasonably well at school would aim for a degree as first choice. Normally, an Higher Diploma is the second choice for those unable to get onto a degree course.

Considering the consumer's views about the new qualification, there is a strong likelihood that, given the choice, a school-leaver would prefer an Associate Degree course over an Higher Diploma for at least two reasons: First, the word 'degree' in the title has more status than 'diploma', secondly, the Associate Degree is shown to be part of a seamless progression ladder to enable those successful on it to enter the final two years of a four-year degree programme. (The nature of progression from an Associate Degree to a degree programme eventually must be faced by the consumers and the providers, as the seamless system is only a reality if the opportunities for degree study exist for all those successful on Associate Degrees. The availability of resources (and places) will dictate how many Associate Degree graduates can be accommodated on degree programmes.)

Clearly, the VTC, which will have the remaining (and only) Higher Diploma places will be competing for students with those organisations offering the more attractive Associate Degree.

The VTC's Higher Diplomas have been developed and designed in consultation with the employers. Placement and employment information shows that they are well-regarded and meet the needs of the employers. The specific vocational nature of this qualification is a selling point with the employers. However, it is the students (and to an extent their families) who will vote with their feet, and the image of the Associate Degree, with its promise of an 'automatic' entry to a degree programme can provide the encouragement for them to walk away from HDs.

It can be argued that the VTC's role in vocational education and training might easily be jeopardised if the seamless life-long learning approach coupled with the establishment of community colleges and the introduction of the Associate Degree become reality.

THE FUTURE OF VOCATIONAL SUB-DEGREE EDUCATION

If it is believed that a focused, dedicated vocational education and training provider such as the VTC has a significant part to play in modern society through the provision of vocational sub-degree programmes, then a way must be found to position and support it appropriately to the benefit of the students and the community. Furthermore, this should be done in such a way that young people choose such courses as the Higher Diploma as a valued alternative to the Associate Degree. This might be achieved by:

(i) Aggressive marketing exploiting the fact that Higher Diplomas are very practical and work related; a characteristic which is appreciated by both students and employers. This latter fact is verified by high employment rates which averaged 92% in 1999 despite the economic problems that prevailed at that time.

(ii) Negotiating with higher education providers to provide especially designed professional courses to enable Higher Diploma Graduates to gain degree equivalent qualifications leading to full professional recognition. It is also important for such courses to be included in a National Qualifications Framework. It will then be upto the students to decide which route they would wish to follow; the academic university route or the vocational route.

(iii) Promoting the facilities of organisations like the VTC which concentrate resources on employment related education and training programmes. Emphasis bas been given to project orientated teaching and learning activities and the fact that Higher Diplomas are very focused qualifications. By this it is meant that they are stand alone qualifications which fully equip graduates to function at the higher technician or middle management level as well as preparing them for more advanced study. This is unlike the Associate Degrees which are equivalent to the first two years of a four-year degree and are, therefore, not specifically work related or terminal qualifications.

(iv) Promoting the VTC's cost-effectiveness which results from it not having to sustain a degree level environment. It would, therefore be more cost effective to the tax payer if the VTC increased its sub-degree work at the expense of the Universities.

(v) The VTC modifying its 3-year Higher Diploma structure to exempt Form 7 graduates from the first year; a change planned for the 2001/02 academic year. This modification will also facilitate a two-year Higher Diploma for the Form 6 school leavers in 2007, the date the educational reforms will probably come into effect as previously discussed.

(vi) Emphasising the fact that there are more than sufficient school leavers to support both Associate Degrees and Higher Diplomas, on the assumption that the current Form 5 pool, which will probably become the Form 6 pool in 2007, is around 80,000 students.

There are also crucial questions which have to be addressed in connection with the future of the VTC, in general these are:

(a) can the VTC and dedicated vocational education survive as part of a community college culture, with a seamless progression ladder covering the whole range of Hong Kong's education system and the qualifications offered; and

(b) should societies which espouse comprehensive, life-long seamless education systems also encourage and support dedicated focused education and training sectors such as those represented by the VTC? If so, is it a contradiction in terms for such a system to have this type of a sector?

There are, of course, many ways to answer these questions. In the UK, for example, the vocational and Associate Degree routes are clearly defined through the National Vocational Qualifications (NVQs) and the Associate Degree/Degree qualifications. The NVQ's are offered through a combination of the recognition of experience gained in the work place and attendance at Further/Higher Education Colleges, while the Associate Degree and Degree programmes remain in the control of the University Sector. Parity, or formal recognition of NVQ's, is achieved by bench marking them against the more traditional qualifications of 'O' levels, 'A' levels and Degrees. Another example may be taken from Australia where in Victoria in particular, the binary divide can be overcome by integrating the vocational, TAFE, colleges with universities. This has broken down, in both the eyes of the students and industry, the barriers between vocational and the more traditional university style of education. It must be emphasized that in both of these examples the respective governments played, and continue to play, an important role. These roles include financial support for vocational education and training and the enforcement of a Qualifications Framework.

In conclusion, the coexistence of, and indeed benign growth of both vocational education awards and Associate Degrees can best be facilitated if a seamless system of tertiary education is developed, one which resembles the Australian system where TAFE and degree awards are well integrated through recognition, validation and credit transfers. A Hong Kong equivalent of the Australian Qualifications Framework providing benchmarking for TAFE awards will also benchmark vocational qualifications against University awards. At the same time, through credit transfers and validation, graduates of vocational education will unequivocally be certain of their career and educational pathways, be they wishes to join the workforce or further their studies. Educationists

and government officials alike should strive to achieve these goals in the near future in order that Hong Kong makes best of its human capital investment strategies.

ASSOCIATE DEGREE PROGRAMME OVERSUBSCRIBED

Among the 35,000 A-level students this year, only 14,500 obtained satisfactory examination results and were able to pursue higher education in the local tertiary institutions. Yesterday, more than a thousand F7 graduates with unsatisfactory results applied for the new associate degree courses offered by the University of Hong Kong and the Baptist University. The former alone received more than 600 applicants. This showed that there was a great demand for associate degree courses.

Starting from this year, students who were unable to enter university through the "normal route" could first obtain an associate degree and then apply for a bachelor's degree courses in local or overseas universities by means of that qualification.

The associate degree courses of each institution had their own characteristics. Students could choose the courses according to their own interest. Among the institutions, the Baptist University charged the highest course fees.

The Baptist University said that the associate degree courses were welcomed by F7 graduates. It was expected that more graduates would apply for these courses when they changed their choices.

The University of Hong Kong said that the associate degree courses received an overwhelming response. Many telephone calls enquiring about these courses were received. More than 600 applications were received in a day, which was the same as the number of places to be offered.

A student who had applied for an associate degree course of the University of Hong Kong was worried that the courses could not be linked up with the degree courses in all universities. She also feared that she might not be able to obtain a bachelor's degree eventually at a local university after completing the associate degree course. Although an associate degree course was more expensive, she said it was still worthwhile to apply for it since it could lead to a degree course eventually.

Taken from the Sing Tao Daily July 8th 2000

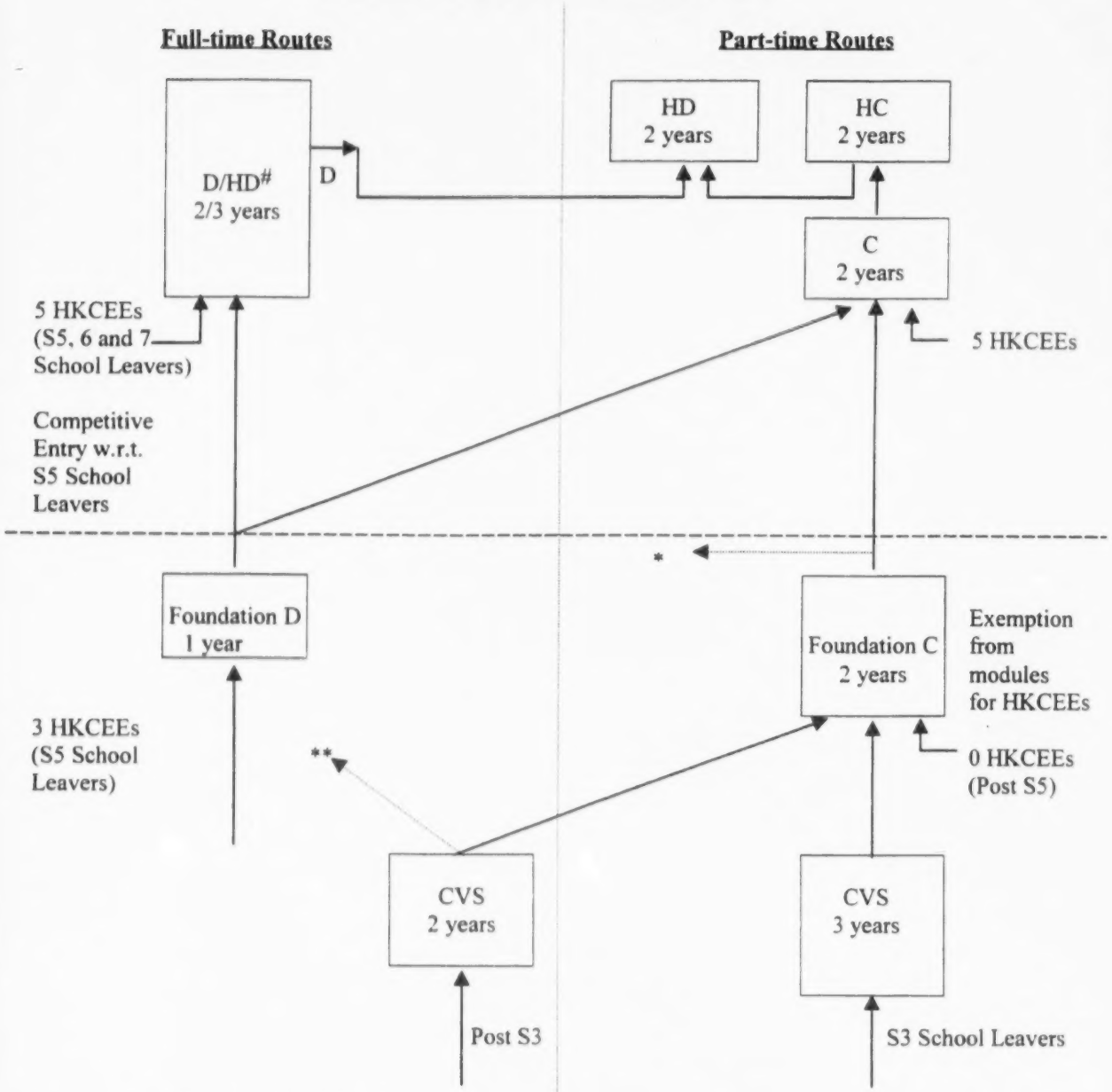
Associate Degree Programmes Offered by Local Universities

Institutions	Intake	Annual Course Fee	Duration	Subjects	Entry Requirements	Prospect
HKU SPACE Community College	about 600	$32,000-$40,000	2 or 3 years	- Accounting - Art & Design - Business Studies - Information Technology - Law - Nutritional Sciences	Completed F.5 – F.7; or Aged 21 above with working experience	Enroll in Year 1 to 3 of North American, British and local universities, depending on the courses taken
The Chinese University (School of Continuing Studies)	140	$35,000-$40,000	mainly 2 years, depending on the duration for earning 60 credit units	- Information Technology - Business, Economic & Management	Completed F.5 or above; F.7 graduates can be exempted from certain credit units	Year 3 of University of California, USA
The Baptist University of Hong Kong (School of Continuing Education)	300	$48,750	2 years	- Business - Communication Studies - Psychology - Computer Science/ Mathematics - Science & Technology - Languages	minimum 5 passes in HKCEE (including English Language)	- Year 1 or 2 of Baptist University or other local universities - Year 3 of Western Michigan University, USA - Year 2 or 3 of British, American and Australian universities
The Hong Kong Polytechnic University (School of Professional Education and Executive Development)	not yet confirmed	$31,575	2 years	- Hotel, Catering, Tourism Management - Rehabilitation Science - Engineering - Multi-media Design & Technology - Languages - Social Work	Completed F.7 with passes in Chinese and English Languages; Grade E or above in 1 A-level subject or in 2 AS level subjects and in 6 HKCEE subjects	the credit units earned will be recognized by the PolyU

Institutions	Intake	Annual Course Fee	Duration	Subjects	Entry Requirements	Prospect
The City University of Hong Kong (College of Higher Vocational Studies)	not yet confirmed	$31,575	2 years	- Building Science & Technology - Language Studies - Commerce - Social Studies - Computer Studies - Creative Media Studies	ditto	- Year 2 of CityU - overseas universities

DIAGRAM 1

IVE MAINSTREAM COURSES FROM 1999



* Exceptional students may be able to compete for places on the D/HD.

** Exceptional students may be able to gain entry to the Foundation D.

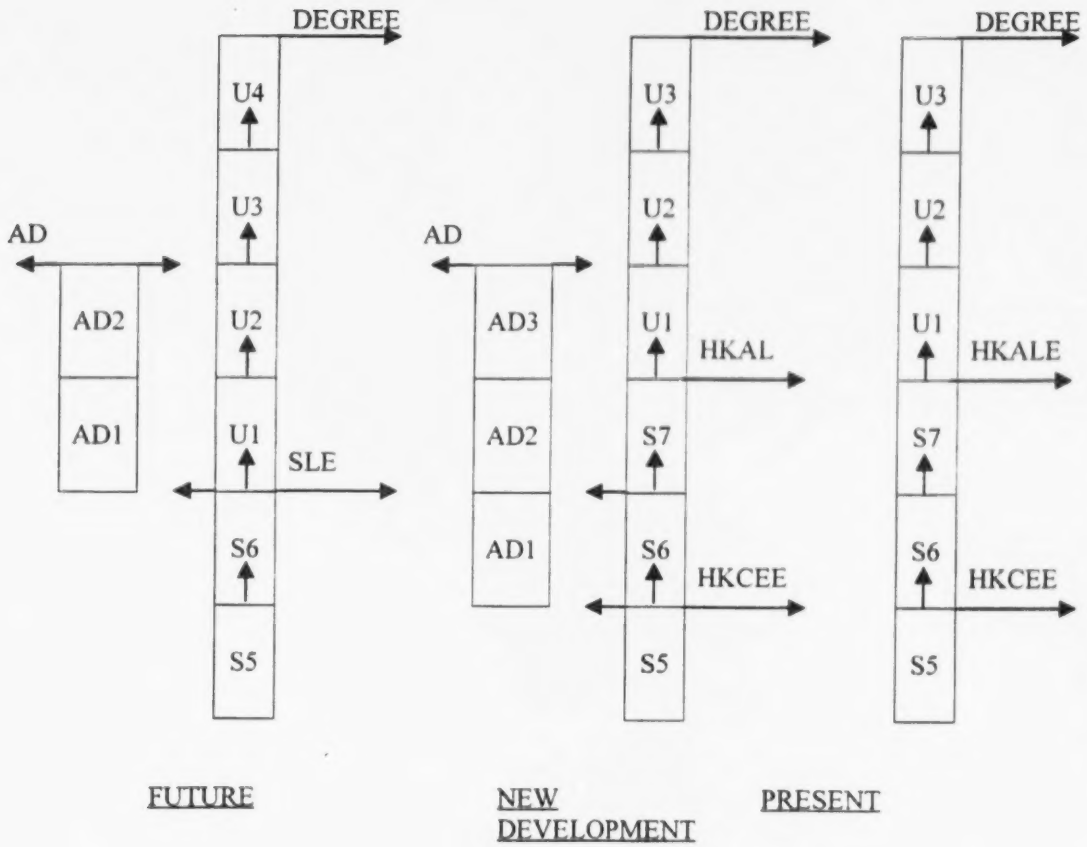
\# There are also some stand alone Diplomas and Higher Diplomas.

Key

HD: Higher Diploma
D: Diploma
HC: Higher Certificate
C: Certificate
CVS: Certificate in Vocational Studies

DIAGRAM 2

ACADEMIC ROUTES TO A DEGREE



FUTURE NEW DEVELOPMENT PRESENT

KEY:

S ≡ SECONDARY EDUCATION

U ≡ UNIVERSITY EDUCATION

AD ≡ ASSOCIATE DEGREE

HKAL ≡ HONG KONG ADVANCED LEVEL EXAMINATION

HKCEE ≡ HONG KONG CERTIFICATE OF EDUCATION EXAMINATION

SLE ≡ SECONDARY LEAVING EXAMINATION

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